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Evaluation of Visegrad Four convergence in the context of EU cohesion

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Abstract

The elimination of differences between the less and most developed EU Member States and support of European territory cohesion are long-term goals of the European Union (EU). Nevertheless there is no common approach for their measurement and evaluation at either European or national level. The paper evaluates the level of convergence and cohesion in the Visegrad Four countries (Czech Republic, Hungary, Poland, Slovakia) in the period 2004–2010, on the basis of an aggregate synthetic index of disparities computing by two selected mathematical and statistical methods. The theoretical part of the paper defines the concept of cohesion and disparities in the EU and focuses on the possible methods of convergence measurement and cohesion evaluation. The empirical part of the paper deals with the measurement and comparison of Visegrad Four convergence through the aggregate synthetic index of disparities. The aggregate synthetic index of disparities is calculated on the basis of the point method and standardized variable method. According to the development of disparities (a convergence or divergence trend), the level of cohesion achieved by the Visegrad Four countries is evaluated.

Keywords

Aggregate synthetic index of disparities, cohesion, convergence, point method, standardized variable method, Visegrad Four countries.

JEL Classification: C83, R11, Y1

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1. Introduction

Since the 1980s, the gradual enlargement of the European Community has brought the Member States new possibilities of economic development. On the other hand, EU enlargement has been associated with an increase in economic, social and territorial differences that arise from the different historical, cultural and economic development of the European countries. In particular, the accession of the Visegrad Four countries (Czech Republic, Hungary, Poland, Slovakia) represented one of the biggest challenges for the cohesion and competitiveness of the European territory, or rather EU Cohesion policy. Through the EU Cohesion policy, the European Union aims to reduce the economic, social and territorial disparities and support backward states and their regions so that they can catch up with the rest of the EU member states. Although the convergence process has been monitored, significant disparities between EU Member States and regions have persisted (see e.g. European Commission, 2007: 2010). Therefore, the analysis of disparities among EU countries and regions is still an actual and important topic of many discussions and regional research studies at European level (e.g. Wishlade and Yuill, 1997; Felsenstein and Portnov, 2005; Vorauer, 1997; Matlovič et al., 2008). The attention is focused on the measurement of disparities between states that impede the well-balanced development and strengthening of cohesion in *new* EU countries, especially in the Visegrad Four countries (V4) (see e.g. Viturka, 2010; Tvrdoň and Skokan, 2011; Tuleja, 2010; Viturka et al., 2009). Nevertheless, there is neither a uniform approach to disparities analysis and measurement nor any comprehensive index for cohesion evaluation at European and national level. This paper thus responds to the multidimensional problems of disparities and presents possible methods of convergence measurement and cohesion evaluation.

The main aim of the paper is to measure the level of convergence and cohesion in the Visegrad Four countries in the period 2004–2010. For this purpose, the aggregate synthetic index of disparities will be computed by selected mathematical and statistical methods. The evaluation of cohesion results from the generally accepted concept of Willem Molle (2007) that says *the lower the disparities, the higher the level of cohesion in the territory and vice versa*. On the basis of the analysis results, it is possible to accept or reject the hypothesis that disparities between the Visegrad Four countries have reduced and the territory has achieved a higher level of cohesion since 2004.

The paper deals with the concept of cohesion and disparities in the EU in the theoretical part. The paper also presents the selected methods of convergence measurement and approaches to cohesion evaluation. The practical part focuses on the determination of the aggregate synthetic index of disparities, and the point method and standardized variable method used. Based on the observed level of convergence, the cohesion of the V4 countries is evaluated. The European Statistical Office (Eurostat) database is a basic source of available and comparable national information. In the conclusion of the paper, the results obtained using the chosen methods are discussed and compared.

2. Theoretical background of cohesion and disparities in the EU

The theoretical concept of cohesion is associated with distinguishing three concepts of cohesion. The first concept sees *cohesion* as a policy objective which seeks to promote the harmonious development of economic activities and create equal opportunities for all citizens throughout the EU. This concept thus provides an answer to the question *what* is the objective of Cohesion policy. The second concept–*convergence* is an expression of *how* the concept of cohesion can be achieved. The term convergence is generally defined as the process of approximation of certain characteristics of the units. Convergence represents the balancing of the socio-economic disparities between states and regions. The concept of convergence deals with the achievement of socio-economic convergence of countries as a necessary precondition, without which the political objective of cohesion cannot be fulfilled. *Cohesion is in this theory the output of the process of convergence* (Leonardi, 2005). The third concept–the *integration process* provides an answer to the question of *when*, which implies the creation of supranational institutions and

adopting rules to support the process of achieving convergence and cohesion (Leonardi, 2005).

The concept of EU Cohesion policy is based on solidarity between more and less prosperous states (regions). Increased competitiveness and convergence of their economic performance with an average EU level have become the basic objective for *new* Member States after joining the EU. Support for convergence, cohesion and competitiveness was included in the various development programmes of the Member States at national and European level. In the period 2007–2013, EU Cohesion policy focuses on the support of regional growth, innovation and job creation through multi-annual development programmes. The greatest investments are allocated to the least prosperous countries, regions and areas, whose development is lagging behind.

The support of economic and social cohesion has been clearly emphasized in the European legislative documents of the primary law since the (Single European Act, 1986; Maastricht Treaty, 1993; Treaty of Lisbon, 2009). However, the exact definition of the term *cohesion* has not been clearly defined yet (Skokan, 2008). The European approach to cohesion is built on the theory of disparities. Thus, cohesion can be expressed by a level of differences between states, regions or groups that are politically and socially tolerable (Molle, 2007). This concept implies that the existence of disparities[1], including their elimination, is one of the main aspects of EU Cohesion policy.

In the European Union, three dimensions of cohesion are generally distinguished. *Economic cohesion* represents the economic convergence between the less and more developed countries (regions). The level of economic development and performance is evaluated by economic indicators (e.g. GDP per capita, labour productivity, expenditure on R&D). *Social cohesion* is mainly focused on the elimination of social disparities, inequalities and social exclusion. The level of social cohesion is mostly expressed by demographic indicators or indicators of the labour market (e.g. rates of employment, unemployment, and long-term unemployment). *Territorial cohesion* represents the balanced distribution of human activities within the EU and equal access for citizens and businesses to services of general economic interest (e.g. access to transport, energy, telecommunication and information society, etc.). Territorial cohesion can be assessed by a wide range of indicators coming from the broad horizontal territorial concept (Skokan, 2008).

Types of disparities

If we assume that a decrease or increase of disparities is a measure of convergence and consequent cohesion, high quality understanding and evaluation of disparities provides important information about the country (region, county) and its position in relation to others, in terms of economic performance and social and environmental living conditions. According to the horizontal classification, we recognize three types of disparities: economic, social and territorial. *Economic disparities* reflect the level of economic cohesion which can be achieved if all economic segments (namely regions) are included in the European economy in such a way as to be able to face international competition. Economic cohesion increases when the weakest countries (regions) are able to catch up with advanced ones (Molle, 2007). *Social disparities* are related to how people perceive spatially differentiated quality of life, standard of living, social inequality, etc. Measures of social disparity have primarily been considered in relation to unemployment (Wishlade and Yuill, 1997). *Territorial disparities* reflect strong inequalities of the EU´s level of competitiveness factors. Territorial inequality is expressed by the significant differences of economic performance, physical-geographical potential and transport and technical infrastructure, capacity for innovation or environmental quality. These differences are most important between centres and peripheries, such as urban and rural areas.

3. Approaches to cohesion evaluation and methods of measuring disparities

The measuring of socio-economic disparities between states is among the main issues of economic research because they are a major obstacle to the balanced and harmonious development of the EU as a whole territory. Nevertheless, measurement of disparities and evaluation of cohesion at any level of territorial development is impaired by a lack of integrated approaches and methodologies in the EU.

3.1 Approaches to cohesion evaluation in the EU

The evaluation of cohesion is related to the problem of the lack of uniform methods or an aggregate index which measures progress in achieving economic, social and territorial cohesion in the EU. These days, there are indexes evaluating one of the three dimensions of cohesion, e.g. Farrugia and Gallina (2008) who propose the construction of an index of territorial cohesion using the indicators of territorial disparities, or Bárcena et al. (2010) who, in cooperation with the

[1] *Disparity* is the variance or inequality of the signs, phenomena or processes, their identification and comparison having some rational sense (cognitive, psychological, social, economic, political, etc.) (Kutscherauer et al., 2010a).

European Commission, evaluated the social cohesion in Latin America by constructing an index of social cohesion.

The evaluation of the cohesion level thus results *from the progress of the relevant economic, social and territorial indicators of disparities that reflect the level of convergence between states in the EU or to an average level of the EU*. The disparities trends and the cohesion status of all EU member states and their regions are evaluated within the *Reports on Economic, Social and Territorial Cohesion* (European Commission, 2007, 2010) published by the European Commission every three years. The indicators which are most frequently used for expressing the level of cohesion are provided in Table 1.

Another possible approach to assessing EU cohesion uses *Structural indicators* (14 indicators in six thematic areas). Structural indicators were used for evaluation of the Lisbon strategy´s objectives in 2000–2010 (Melecký and Skokan, 2011).

3.2 Selected methods of disparities measurement

Most of the existing approaches to disparities measurement use several indicators that are processed by different mathematical and statistical methods. The aim is usually to obtain one comprehensive index (or more indices in the case of thematic evaluations) that represents each of the territories analysed. Most of the economic inequalities are measured by a variety of indices based on the indicator of gross domestic product –coefficient of variation and Hoover Concentration Index, the Herfindahl index, the Geographic concentration index and the Theil index (see e.g. Tvrdoň, 2012). A highly innovative approach to disparities analysis in regional development is presented by Viturka (2010). This consists of a modified production function, a follow-up evaluation of the quality of the business environment and aggregate factors concerning the utilization of human resources and innovative potential. The criterion for selection of methods should be the high informative level of the index rather than the calculation level of the method (Tuleja, 2010). From the point of view of ease of calculation, high informative level and applicability of the results in practice, the following mathematical and statistical methods are often used to measure disparities (Kutscherauer et al., 2010a):

- point method,
- traffic light method (scaling),
- method of average (standard) deviation,
- method of standardized variable,
- method of distance from the imaginary point.

From the perspective of practical utilization, the traffic light method can be applied in the phase of identifying and quantifying the variables (see e.g. Melecký and Skokan, 2011). The point method and the standardized variable method are appropriate in particular for calculating the index of disparities (see e.g. Tuleja, 2010; Svatošová and Boháčková, 2012).

Within this paper, the aggregate synthetic index of disparities is determined by the point method and the standardized variable method.

Table 1 Selected indicators for evaluating of EU cohesion

Dimension of cohesion	*Indicators of disparities*
Economic cohesion	Growth of GDP per capita (%)
	GDP per capita in Purchasing Power Standards (PPS) (%, EU27 = 100)
	Labour productivity (% GDP per capita employed in PPS, EU27 = 100)
	Gross domestic expenditure on research and development (GERD) (% of GDP)
	Patent applications to the European Patent Office (EPO) (applications per million inhabitants)
Social cohesion	Employment rate (% of population aged 15–64)
	Employment rate of older workers (% of population aged 55–64)
	Unemployment rate (% of labour force)
	Long-term unemployment (% of labour force)
	Men and women at risk of poverty (% of men/women)
Territorial cohesion	Hospital beds (number per 100,000 inhabitants)
	Density of motorways (kilometres per 100,000 km^2)
	Households with broadband connection (% of all households)
	Accessibility to passenger flights (number of passenger flights per day)
	Availability and use of e-Government services (% of online availability of 20 public services)

Source: European Commission (2007, 2010), own elaboration

Determination of the aggregate synthetic index using the point method

The point method starts by seeking the country (region) that attains the *maximum or minimum value* for the analysed indicators. While the minimum value is considered when there is a progressive decline in the indicator, the maximum value is used in the opposite case, i.e. when there is progressive growth in the value of the indicator. The country (region) with the maximum value for the indicator is then assigned 1,000 points (the criterial value), while the other countries (regions) are assigned points in the range of 0 to 1,000, depending on the per mile range which is measured by the value of their own indicators from the criterial value given in advance. If the minimum value is considered to be a criterion, then it is used as the reciprocal value of this ratio (Kutscherauer et al., 2010b). A point value of the given indicator is defined by the following formula:

$$B_{ij} = \frac{x_{ij}}{x_{i\max}}, \text{or } \frac{x_{i\min}}{x_{ij}}, \quad (1)$$

where B_{ij} is the point value of the i-th indicator for the j-th country (region), x_{ij} represents the value of the i-th indicator for the j-th country (region), $x_{i\ max}$is the maximum value of the i-th indicator (1,000 points) and x_{imin} is the minimum value of the i-th indicator (1,000 points). By adding up the points and calculating them in this way, we obtain the final value of the aggregate synthetic index. This index illustrates the monitored country (region) level, which can then be used for setting the disparity rates generated between different countries (regions). We can calculate the given aggregate synthetic index of disparities instead of a simple sum of points by using the *weighted arithmetic mean* of points of the different regions acquired for given indicators. In this case, the following formula will be used for calculation of the *aggregate synthetic index of disparities* (I_D):

$$I_D = \frac{1}{p}\sum_{i=1}^{p}\frac{x_{ij}}{x_{i\max}}, \text{or } \frac{x_{i\,min}}{x_{ij}}, \quad (2)$$

where p is the number of indicators.

The main advantage of this method is its ability to summarize the different units of measurement that can be provided by one synthetic characteristic, which is the dimensionless figure. By using the aggregate synthetic index, we can set the order of different countries (regions). We can also define total or only partial (regional) differences and can thus reach the conclusion that country (region) A generally falls behind country (region) B (Tuleja, 2010).

Determination of the aggregate synthetic index using the standardized variable method

The second method for calculating the aggregate synthetic index of disparities is *the standardized variable method*, which can be expressed by the following formula (Kutscherauer et al., 2010b):

$$U_{ij} = \frac{x_{ij}-x_{i\max}}{s_{xi}}, \text{or } \frac{x_{i\min}-x_{ij}}{s_{xi}}, \quad (3)$$

where u_{ij} is the standard variable of the i-th indicator for the j-th country (region), s_{xi} is the standard deviation of the i-th indicator.

The standard variable is the dimensionless variable which has zero as unit average. The point method looks to be good to use the *average value* of the standard value in this case well. *The aggregate synthetic index of disparities* (I_D) based on the standard variable method can be calculated by the following formula:

$$I_D = \frac{1}{p}\sum_{i=1}^{p} u_{ij}. \quad (4)$$

The main advantage of both methods is that they take indicator variability into account in the appropriate index. But the standardized variable method takes into consideration the relative variability of the indicators and subordinates the absolute variability, which, in turn, the point method takes account of.

4. Evaluation of convergence and cohesion in V4 by the aggregate synthetic index of disparities

Nine indicators of economic, social and territorial disparities were identified for the purpose of calculating the aggregate synthetic index of disparities:

- GDP per capita in PPS (%, EU27= 100),
- Gross domestic expenditure on research and development (GERD) (% of GDP),
- Labour productivity (%, EU27 = 100),
- Employment rate aged 15–64 (%),
- Employment rate of older workers aged 55–64 (%),
- Long-term unemployment (%),
- Density of motorways (kilometres per 100,000 km^2),
- Hospital beds (number per 100,000 inhabitants),
- Households with broadband connection (% of all households).

These indicators are *the most frequent indicators* monitored within Cohesion reports (see European Commission, 2007, 2010). Moreover, each dimension of cohesion is represented by three selected indicators of disparities. Selection of these indicators is based on the availability of data in the Eurostat database in terms of statistical territorial unit NUTS 0 in V4. The reference period 2004–2010 is determined by the V4 accession to the EU and the availability of the disparities indicators at the national level. The basic values of the indicators for the period 2004–2010 are shown in the Annex, Tables 6–14.

4.1 Evaluation of convergence and cohesion in V4 based on the point method

The first step in constructing the aggregate synthetic index of disparities is the evaluation of selected indicators of disparities by relevant points (0–1,000) for each country in the given year of reference. Table 2 shows the scores in the case of the indicator GDP per capita in PPS (the evaluation criterion is the maximum).

After determining the point values for each indicator, the aggregate synthetic index of disparities can be defined using a *mean* function. The average score is calculated from the values of all indicators acquired in a given year and country. The calculated average value thus represents the aggregate synthetic index of disparities (Tuleja, 2008). *The closer the value of the index to the criterial value 1,000 points (maximum or minimum value of indicator), the better the country fulfils the criterion and the higher the level of convergence achieved.*

As Table 3 shows, positive development of disparities (reducing) was recorded in all V4 countries in the period 2004–2010. This was demonstrated by the increasing value of the aggregate synthetic index of disparities. As Table 3 shows, *the Czech Republic* converged most to the optimal value compared with the other countries. The aggregate index value of disparities increased during each year of the reference period 2004–2010 (with the exception of 2010) and converged to the criterial value 1,000 (the value of the index was 879.69 in 2010). On the other hand, *Poland* was least successful at meeting the selected criterion.

The aggregate index of disparities in Poland at the end of the reference period converged the least out of all the V4 countries (the index of disparities value was 702.09 in 2010). These results demonstrate the presence of relatively significant disparities in the V4 countries and different levels of convergence.

On the basis of the decreasing disparities between states, *the total ranks of countries* can be demonstrated (1–4). *The Czech Republic* can be ranked in first place among the V4 countries according to the growing index of disparities over the period 2004–2010. *Hungary* is in second place. In third place is *Slovakia*, followed by *Poland* in last place. Poland can be regarded as the country that converged the least to an optimal value and also to the Czech Republic.

Table 2 Point score of indicator GDP per capita in PPS

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	939.76	951.81	963.86	1000.00	975.90	987.95	963.86
Hungary	759.04	759.04	759.04	746.99	771.08	783.13	783.13
Poland	614.46	614.46	626.51	650.60	674.70	734.94	759.04
Slovakia	686.75	722.89	759.04	819.28	879.52	879.52	891.57

Table 3 Aggregate synthetic index of disparities calculated on the basis of the point method (dimensionless figure)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Index of disparities							
Czech Republic	710.92	731.07	777.96	831.58	864.02	905.84	879.69
Hungary	649.68	663.64	700.36	711.36	759.78	785.18	791.79
Poland	481.46	500.32	525.51	570.18	651.06	693.55	702.09
Slovakia	525.34	550.94	576.60	637.53	683.49	696.36	719.29
Rank							
Czech Republic	1	1	1	1	1	1	1
Hungary	2	2	2	2	2	2	2
Poland	4	4	4	4	4	4	4
Slovakia	3	3	3	3	3	3	3
Total average rank							
Czech Republic			*1*				
Hungary			*2*				
Poland			*4*				
Slovakia			*3*				

4.2 Evaluation of convergence and cohesion in V4 on the basis of standardized variable method

The starting point for calculation of the aggregate index of disparities using the standard variable method is to determine *the standard deviation* (s_x) for the time series of the indicators. The second step is to find the maximum (minimum) values of the indicator that are subsequently considered as criterial values (Tuleja, 2008). The individual standard variables are obtained by substituting all the variables into formula (3).

An example of the final values of the standard variable in the case of GDP per capita in PPS is illustrated in Table 4. As for the point method, the aggregate synthetic index of disparities is represented by the average value in a given country and year. The average value is computed from all the values of the standard variables achieved by the individual country in a given year. From Table 5 it is evident that the aggregate index of disparities has become a negative value. *The closer the value of the index to the criterial value 0, the better the country fulfils the criterion and the higher the level of convergence achieved.*

Table 5 shows that the values of the standard variables have converged to the optimal value (0) over the whole reference period, which confirms the decreasing disparities between the V4 countries during the years 2004–2010. The best results were those of the *Czech Republic*, while the value of the aggregate index of disparities converged towards the required value 0 for all the V4 countries (i.e. the index of disparities amounted to –0.68 in 2009). The most visible improvement in the index was recorded in *Poland* at the end of the period, although that country's index of disparities value converged the least towards the optimal value (calculated as –2.06 in 2009).

Based on its convergence towards the criterial value, *Poland* was ranked last in the overall evaluation in the period 2004–2010. On the other hand, the *Czech Republic* was in first place. It follows that the highest disparities and the lowest level of convergence were recorded between Poland and the Czech Republic.

5. Conclusion

Evaluation of European cohesion results from the progress of economic, social and territorial disparities between states that reflect the level of convergence of EU countries. Convergence represents the balancing of the socio-economic disparities between states and regions and it is a necessary precondition, without which cohesion cannot be achieved. There are many opinions and methods of disparities measurement

Table 4 Standardized value of GDP per head in PPS

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	–0.51	–0.41	–0.30	0.00	–0.20	–0.10	–0.30
Hungary	–2.03	–2.03	–2.03	–2.13	–1.92	–1.82	–1.82
Poland	–3.24	–3.24	–3.14	–2.94	–2.73	–2.23	–2.03
Slovakia	–2.63	–2.33	–2.03	–1.52	–1.01	–1.01	–0.91

Table 5 Aggregate synthetic index of disparities calculated on the basis of standard variable method (dimensionless figure)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Index of disparities							
Czech Republic	–1.26	–1.16	–0.98	–0.79	–0.77	–0.68	–0.71
Hungary	–1.95	–1.83	–1.65	–1.78	–1.56	–1.44	–1.40
Poland	–3.17	–3.10	–2.92	–2.64	–2.31	–2.06	–1.97
Slovakia	–2.78	–2.59	–2.35	–1.94	–1.63	–1.63	–1.57
Rank							
Czech Republic	1	1	1	1	1	1	1
Hungary	2	2	2	2	2	2	2
Poland	4	4	4	4	4	4	4
Slovakia	3	3	3	3	3	3	3
Total average rank							
Czech Republic			*1*				
Hungary			*2*				
Poland			*4*				
Slovakia			*3*				

which differ in the way they use and process the indicators. Within this paper, the convergence measurement and cohesion evaluation in the V4 countries were based on the alternative method of constructing an aggregate synthetic index of disparities. The aggregate synthetic index of disparities was computed on the basis of two statistical methods – the point method and the standardized variable method. The main advantage of these two methods is the ability to summarize the different units of measurement under a single synthetic characteristic, which is the dimensionless figure. Other advantages are the undemanding calculation of methods and high informative level.

The results of analysis *confirmed the hypothesis of the paper* stated in the Introduction that since 2004 disparities between the Visegrad Four countries have been reduced. It follows that the *process of convergence and strengthening of cohesion* were recorded in the V4 countries in the period 2004–2010.

Based on the convergence of the aggregate synthetic index of disparities towards the selected criterial value, the *Czech Republic* converged most to the optimal value out of all the V4 countries, ranking in first place. Hungary was ranked in second place and Slovakia in third. By contrast, *Poland* converged the least towards the optimal development and was ranked in fourth place. The greatest differences existed between the Czech Republic and Poland.

The aggregate synthetic index of disparities computed by the two selected methods showed *equal results* in the final evaluation of disparities and convergence between the V4 countries. Despite the elimination of disparities and the convergence process, differences still exist in the level of development in the Visegrad Four countries. These disparities can negatively affect cohesion and competitiveness of this group.

It is also necessary to take into account that different approaches, methods and indicators may yield different results. This may be partly caused by the absence of a uniform European approach to evaluation of the broad horizontal concept of economic, social and territorial cohesion. On the other hand, the comprehensive and quality recognition of the convergence level resulting from analysis of disparities can significantly contribute to increasing countries' development potential, cohesion and competitiveness.

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Appendix

Table 6 GDP per capita in PPS in the period 2004–2010 (%, EU27 = 100)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	78.00	79.00	80.00	83.00	81.00	82.00	80.00
Hungary	63.00	63.00	63.00	62.00	64.00	65.00	65.00
Poland	51.00	51.00	52.00	54.00	56.00	61.00	63.00
Slovakia	57.00	60.00	63.00	68.00	73.00	73.00	74.00

Source: Eurostat (2011), own elaboration

Table 7 Gross domestic expenditure on research and development (GERD) in the period 2004–2010 (% of GDP)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	1.20	1.35	1.49	1.48	1.41	1.48	1.56
Hungary	0.88	0.94	1.1	0.98	1.00	1.17	1.16
Poland	0.56	0.57	0.56	0.57	0.60	0.68	0.74
Slovakia	0.51	0.51	0.49	0.46	0.47	0.48	0.63

Source: Eurostat (2011), own elaboration

Table 8 Labour productivity in the period 2004–2010 (%, EU27 = 100)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	73.00	73.00	74.00	76.30	74.00	75.00	73.50
Hungary	67.00	67.60	67.80	67.00	70.90	72.10	71.20
Poland	61.80	61.60	61.00	62.20	62.30	65.50	66.80
Slovakia	65.80	68.80	71.70	76.40	80.10	80.50	82.20

Source: Eurostat (2011), own elaboration

Table 9 Employment rate aged 15–64 in the period 2004–2010 (%)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	64.10	64.80	65.30	66.10	66.60	65.40	65.00
Hungary	56.60	56.90	57.30	57.30	56.70	55.40	55.40
Poland	51.40	52.80	54.50	57.00	59.20	59.30	59.30
Slovakia	56.70	57.70	59.40	60.70	62.30	60.20	58.80

Source: Eurostat (2011), own elaboration

Table 10 Employment rate of older workers aged 55–64 in the period 2004–2010 (%)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	42.50	44.50	45.20	46.00	47.60	46.80	46.50
Hungary	30.40	33.00	33.60	33.10	31.40	32.80	34.40
Poland	26.10	27.20	28.10	29.70	31.60	32.30	34.00
Slovakia	26.00	30.30	33.10	35.60	39.20	39.50	40.50

Source: Eurostat (2011), own elaboration

Table 11 Long-term unemployment in the period 2004–2010 (%)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	4.20	4.20	3.90	2.80	2.20	2.00	3.00
Hungary	2.70	3.20	3.40	3.40	3.60	4.20	5.50
Poland	10.30	10.30	7.80	4.90	2.40	2.50	3.00
Slovakia	11.80	11.70	10.20	8.30	6.60	6.50	9.20

Source: Eurostat (2011), own elaboration

Table 12 Density of motorways in the period 2004–2010 (kilometres per 100,000 km^2)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	6.92	7.15	8.30	8.33	8.76	9.24	9.31
Hungary	6.12	6.84	8.44	9.22	13.69	13.68	15.88
Poland	1.77	1.77	2.12	2.12	2.45	2.72	2.74
Slovakia	6.45	6.68	6.68	7.43	7.83	7.97	8.48

Source: Eurostat (2011), UNECE (2012), Central Intelligence Agency (2012), own elaboration

Table 13 Hospital beds in the period 2004–2010 (number per 100,000 inhabitants)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010**
Czech Republic	763.20	754.20	741.20	727.30	715.80	710.10	717.73
Hungary	783.50	786.20	792.10	719.30	711.00	715.00	715.10
Poland	667.00	652.20	647.50	642.50	661.80	665.00	656.43
Slovakia	689.50	676.70	670.90	674.90	655.00	649.70	659.86

Note:* forecast
Source: Eurostat (2011), own elaboration

Table 14 Households with broadband connection in the period 2004–2010 (% of all households)

Country/Year	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Czech Republic	4.00	5.00	17.00	28.00	36.00	49.00	54.00
Hungary	6.00	11.00	22.00	33.00	42.00	51.00	52.00
Poland	8.00	16.00	22.00	30.00	38.00	51.00	57.00
Slovakia	4.00	7.00	11.00	27.00	35.00	42.00	49.00

Source: Eurostat (2011), own elaboration